NOTES ON COCCIDÆ—IV. (HEMIPTERA).*

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In an earlier paper of this series I called attention to the artificial character of the genus *Sphaerococcus*, and began the process of transferring the included species to other genera. At that time specimens of the genotype, *S. casuarinæ* Maskell, were not available for examination, but since then (through the kindness of Professor Cockerell) I have been enabled to see specimens of this species. The suspicion that I then expressed to the effect that this species is merely an *Antonina* is nearly, if not quite, substantiated, for it is certainly of this type. However, there are certain points upon which the genus *Sphaerococcus* may, for the present, be maintained.

I am here redefining the genus. Also, I am removing from this genus three more species, one of which, *S. obscuratus* Maskell, I refer provisionally to the genus *Kuwanina*, another, *S. leptospermi* Maskell, which I refer to the genus *Amorphococcus*, and another, *S. pirogallis* Maskell, for which I name a new genus, *Eremococcus*. I may note here that *Sphaerococcus sylvestris* Ckll. and King, is probably nothing more than an immature stage of some species of *Kermes*.

Genus Sphaerococcus (Maskell).

Coccidæ referable to the subfamily Dactylopiinæ (of the Fernald Catalogue) and belonging to the *Pseudococcus* group, that is, possessing dorsal ostioles. Adult female resembling the female of *Antonina;* apodous; with the antennæ reduced to mere vestiges of three or four minute segments; with the posterior end of the abdomen invaginated to form a short tube at the inner end of which is the anal ring, this bearing six short setæ. Differing from *Antonina* (if at all) only in the fact that the legs are present in the penultimate stage of the female. First stage larva with six-segmented antennæ, with six hairs on the anal ring, with dorsal ostioles.

Type of the genus, *Sphaerococcus casuarinæ* Maskell. It is probable that none of the other species now referred to this genus are congeneric with the geno-type.

Notes.—As I have pointed out in the description given above, this is essentially an *Antonina*, differing only in the fact that the legs are retained in the penultimate stage. However, this point needs investigation. I would call attention to the fact that in one species now referred to *Antonina* (*A. parrotti* Ckll.) the anterior pair of legs alone are retained in what has been described as the adult. In specimens of *A. indica* Green, the legs are lacking in the penultimate stage.

Sphaerococcus casuarinae (Maskell).

Fig. 33.

There is little except detail to add to the description given by Maskell. The species resembles the various species of *Antonina* except that it is more nearly circular. The anal ring bears six short setæ and is not hairless, as asserted by Maskell. Beyond this the material examined does not permit me to go.

*Continued from Canadian Entomologist, vol. 50, p. 113, (1919).

The first stage larva is quite as in *Antonina*. The antennæ are six-segmented. The anal lobes (Fig. 33) bear a single stout spine, a short seta and the usual long seta.

Material examined. From *Casuarina quadrivalvis*, Australia.

Genus AMORPHOCOCCUS Green.

But two species are at present referred to this genus, one *A. mesuæ* Green, from Ceylon and another *A. acaciæ* Brain, from South Africa. With these

Fig. 33.—*Sphaerococcus casuarinæ* (Maskell); dorsal aspect of portion of caudal extremity of first larval stage.

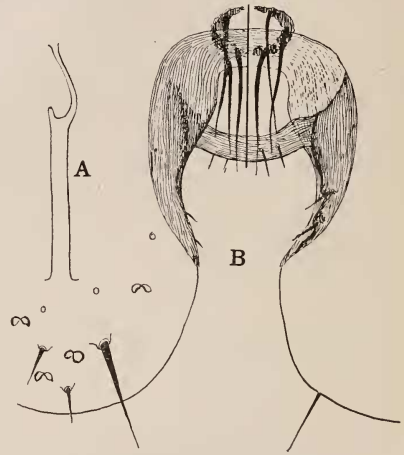

Fig. 34.—*Amorphococcus leptospermi* (Maskell); A, tubular duct; B, anal rings and surrounding structures, left half dorsal, right half ventral.

Sphaerococcus leptospermi Maskell appears to be strictly congeneric. All are gall makers, the galls appearing as twig swellings.

Amorphococcus leptospermi, (Maskell).

Fig. 34.

Habit.—Occurring in a twig gall, this gall being merely a swelling with a small, pore-like opening at the top.

Morphological characteristics.—Adult female apodous and with the antennæ reduced to mere vestiges, which show three or four minute segments. Derm membranous throughout. Pores of the 8-shaped type small and rather few, scattered over the body but most numerous in a narrow zone extending about the lateral margin of the body. Tubular ducts likewise relatively few, of the type shown in Fig. 34A. Anal lobes rather prominent, each bearing one moderately long and two much shorter setæ. Anal ring borne at the inner end of a quite deep cleft, apparently at the end of a short invagination, rather small, bearing six slender setæ. The mouth of the invagination (Fig. 34B) is surrounded by a narrow chitinous ring. From this ring a chitinized area extends posteriorly along each side of the cleft.

Immature stages not seen.

Material Examined.—Specimens from *Leptospermun* sp., Australia, determined by Froggatt at this species and agreeing in general with the original description.

Notes.—Assuming this determination to be correct (as it doubtless is) the original description is in error in the statement that the anal ring is hairless. Also the original description hints at the presence of abdominal spiracles, which are certainly lacking.

This species appears to differ from *A. mesuæ* and *A. acaciæ* in the much deeper anal cleft and the form of the chitinized areas about the anal opening.

Genus KUWANINA Cockerell.

Kuwanina obscurata (Maskell).

Fig. 35.

Habit.—Occurring in galls which are mere swellings of the bark.

Morphological characteristics.—Adult female (Fig. 3A) apodous and with the antennæ reduced to mere vestiges with three or four minute segments. Form broadly oval or subcircular. Derm everywhere heavily chitinized. Anal opening appearing on the ventral side, small, heavily chitinized and only slightly cellular, bearing six very small spines. The opening is covered by a small, cauda-like flap. Constrictions between the abdominal segments very

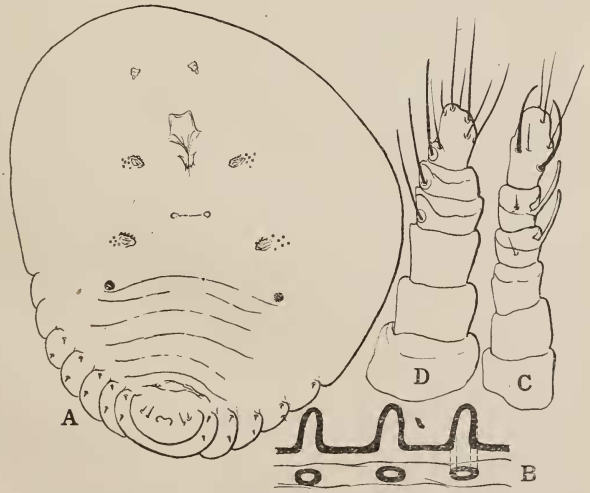

Fig. 35.—*Kuwanina obscurata* (Maskell); A, adult female, ventral aspect; B, pore-like structures of the intersegmental furrows; C, antenna of first stage; D, antenna of penultimate stage.

deep on the dorsal side and extending somewhat to the ventral side. In these constrictions there appear numerous pore-like openings which communicate with invaginations of the derm (Fig. 35B). These invaginations show no evidence of internal pores and are, therefore, hardly to be described as ducts. They are confined to the intersegmental furrows of the abdomen and are most numerous toward the posterior end, forming a continuous, transverse row on the last

four or five segments. Anterior to these segments they appear only toward the lateral margins. Abdomen with a few rather stout, conical spines arranged in transverse rows. Spiracles not unusually large, associated with a few very small, circular pores. Behind each of the posterior pair there is a small, cribriform plate or tubercle.

Penultimate stage.—In form resembling the adult but without the constrictions between the abdominal segments, without the pores in the intersegmental furrows and less heavily chitinized. Antennæ and legs present, the former (Fig. 35C) quite stout, six-segmented, the latter of ordinary character, the tibia somewhat shorter than the tarsus, the claw with a small tooth. Anal ring as in adult but at the tip of the abdomen. Body with a few, scattered conical spines and a very few, small, multilocular pores.

First Stage.—Antennæ (Fig. 35D) six-segmented, the last three segments each with one or two long, stout, curved spines. Anal ring with six slender setæ. Anal lobes each with a single slender seta and two short spines. Derm with a few small, stout spines and multilocular pores.

Specimens examined.—From *Eucalyptus*, New South Wales, Australia. Collected by Koebele and received by me from Mr. Ehrhorn. They agree in all respects with the original description.

Notes.—While it is possible that this species is not strictly congeneric with *K. parvus*, I am inclined to think that it belongs in the group with that species. It will at least rest better in *Kuwanina* than in *Sphaerococcus*. It differs from *K. parvus* in the nature of the first stage and in the entire absence of the tubular ducts which are a conspicuous feature of *K. parvus*, while it agrees in the presence of the pair of cribriform plates or tubercles behind the posterior spiracles.

Genus Eremococcus, new genus.

Coccidæ referable to the subfamily Dactylopiinæ (of the Fernald Catalogue) but of doubtful position within this group. Adult female apodous and with the antennæ reduced to mere unsegmented vestiges; anal orifice simple, minute, borne on the dorsum; dorsum of adult flat, heavily chitinous, venter membranous; mouth-parts with internal framework unusually large and heavily chitinized; first stage larva with anal ring small and simple as in adult, with the antennæ composed of a single very large segment (and possibly one or two minute basal segments), with the anal lobes obsolete and not marked by a long seta. Dorsal ostioles lacking; tubular ducts lacking.

Type of the genus, *Sphaerococcus pirogallis* Maskell.

Notes.—I am unable to throw any light on the relationships of this genus. I would suggest that possibly its nearest relatives are to be sought for in such forms as *Sphaerococcopsis* and *Pseudoripersia*.

Eremococcus pirogallis (Maskell).

Fig. 36.

Habit.—Enclosed within a small, pear-shaped gall which has a minute opening at one side near the base. The insect lies in a saucer-like elevation at the far end of the gall.

Morphological characteristics.—In addition to the characters given in the description of the genus I may add the following. The female of the early adult stage is entirely membranous but at maturity the dorsum becomes heavily

chitinized and the venter becomes much expanded (Fig. 36A). This dorsal, chitinized area is destitute of spines and pores except around its margin where there are numerous slender setæ and pores of the type shown in (Fig. 36B). There are also numerous setæ about the vaginal orifice. The antennæ (or what appear to be the antennæ) are a pair of small, tubular, wrinkled, chitinous structures, usually appearing behind the mouth-parts and presenting no traces of segmentation. The internal framework of the mouth-parts in unusually

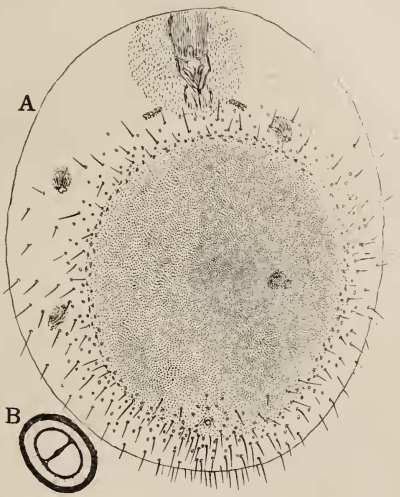

Fig. 36.—*Eremococcus pirogallis* (Maskell); A, adult female, from dorsal aspect; B, type of pore.

large, and the rostrum is borne upon a prominence, the derm of which presents a somewhat papillate appearance. I have been unable to detect any trace of tubular ducts.

The first stage larva is as described under the genus. My material is not in sufficiently good condition to permit the presentation of figures.

Material examined.—Specimens from Froggatt and from Ehrhorn, determined as this species and agreeing with the original description.

WILSONIA—A CORRECTION.

A curious case of lapse of memory occurs in my article, Canadian Entomologist, Vol. LI, p. 212. Although I know several species of *Wilsonia* I used this name for a genus of Aphids. Both Dr. Cockerell and Mr. Criddle have called my attention to it. It is inexcusable. I herewith substitute the name *Dilachnus*.

A. C. Baker.